NOTES ON THE TEXAS ERIOGONUMS

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At the request of Dr. Donovan S. Correll and Dr. Marshall C. Johnston I prepared the treatment of the genus *Eriogonum* (Polygonaceae) for their forthcoming *Manual of the Vascular Plants of Texas*. As this treatment is floristic in nature and the style of presentation does not allow for discussion of the various taxa, this note is presented so that some comment on the species treatment might be made. During the course of this study 19 species have been found to occur in the state of Texas, with most of them restricted to the Trans-Pecos and Panhandle regions. The various species are discussed in the linear-arrangement which will be used in the *Manual*.

1. *Eriogonum alatum* Torr. In a recent unpublished doctoral dissertation, Dr. William J. Hess (1967), now of Western New Mexico University, has revised the species of the subgenus *Pterogonum* (H. Gross) Reveal. In the Texas flora, five of the eight species of this subgenus are found, and I have drawn freely from Hess's dissertation for the first five species in this treatment. The var. *alatum* is found only in western Texas in Brewster and Hudspeth counties, and extends northward to northwestern Nebraska and westward into southwestern Wyoming, eastern Utah and Arizona. Hess recognizes two additional varieties in *E. alatum*, the var. *mogollense* S. Stokes ex M. E. Jones of north-central Arizona and the var *glabriusculum* Torr. which occurs in the Panhandle of northern Texas eastward into central Oklahoma. The var. *glabriusculum* may be distinguished from var. *alatum* by its glabrous inflorescences and involucres. I have seen and collected specimens of this variety from Lubbock and Crosby counties northward.

The chromosome number of var. *alatum* is n = 20 (Reveal, 1967), and the same number may be reported for the var. *glabriusculum* based on *Reveal & Davidse 880*, Tule Canyon, Briscoe Co., Texas. Voucher specimens of all collections are deposited at Utah State University.

2. *Eriogonum nealleyi* Coult. In the subgenus *Pterogonum* this species may be quickly distinguished by its glabrous stems and inflorescences

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and its strigose leaves. This species is known from small, widely scattered populations in central Texas, and rarely are there more than a few hundred plants at the various known stations. The Nealley type was said to have been collected in Pecos Co., but this site has not been relocated. Later collections have come from Reagan, Irion, Coke, Runnels, and Howard counties.

A chromosome count of n = 20 may be reported based on *Reveal & Davidse 901* from 16.2 miles east of Barnhart along U. S. Highway 67, Irion Co., Texas.

3. *Eriogonum hieracifolium* Benth. in DC. In Texas, this species is presently known from Brewster, Pecos, Jeff Davis, and Culberson counties, although I suspect that the plant should be found in the adjacent counties of western Texas. *Eriogonum pannosum* Woot. & Standl. from New Mexico is placed into synonymy, as the type of this species does not differ in any way from the isotypes of *E. hieracifolium* that I have seen. As shown by Hess, this species ranges from western Texas across central New Mexico into eastern Arizona.

A chromosome count of n = 20 has been based on *Reveal & Davidse 902* from 29 miles south of Fort Stockton along U. S. Highway 385 in Pecos Co.; 2.5 miles south of Kent along Texas Highway 118 in Jeff Davis Co., *Reveal & Davidse* 913; 27.5 miles southwest of White's City, New Mexico, along U. S. Highway 62-80, Culberson Co., Texas, *Reveal & Davidse 914*.

4. *Eriogonum hemipterum* (Torr. & Gray) S. Stokes. I. M. Johnston (1944) was the first to carefully discuss this species when he described the var. *griseum* from northern Coahuila and adjacent northeastern Chihuahua, Mexico. Nevertheless, Johnston's note that *E. hieracifolium* f. *atropurpureum* Standl. was referrable to *E. hemipterum* has been largely ignored. The var. *hemipterum* is restricted to the Chisos Mts., Brewster Co., and in the mountains immediately across the Rio Grande in extreme northeastern Coahuila, where it occurs in the oak and juniper forests.

I have counted one collection and found the chromosome number to be n = 20, based on *Reveal & Davidse 906* from the Chisos Mts.

5. *Eriogonum greggii* Torr. & Gray. This species is locally common on the high plains and grasslands of Nuevo Leon and Coahuila, Mexico, with one collection from La Jaiza, Hidalgo Co., Texas, which was collected by *E. J. Walker s.n.* (GH, TEX).

6. *Eriogonum longifolium* Nutt. One of the more complex species in Texas is *E. longifolium*, a member of the subgenus *Eriogonum*. Although much remains to be done on this species, I feel that the treatment to be used in the *Manual* is the most realistic considering the extremes in the species which may be seen throughout its entire range. With some difficulty it is possible to distinguish two varieties in Texas.

The var. *longifolium* extends from western Texas east to a vague line that runs from Grayson Co. south to around Bexar Co. This variety may be distinguished by its generally tomentose stems and leaves and inflorescences which are usually less than one-third the entire length of the plant, although the pubescence of all parts becomes less as one moves to the east and as the plants become taller. For the most part, the var. *longifolium* occurs on gypsum or limestone soils. The western form was described as *E. texanum* Coult. & Fish., non Scheele, which was later renamed *E. coriaceum* Coult. & Fish., but in my opinion, this is only an extremely reduced form of the var. *longifolium*. Additional synonyms of var. *longifolium* are *E. texanum* Scheele, and *E. longifolium* var. *lindheimeri* Gandg., var. *caput-felis* Gandg., and the ssp. *diffusum* S. Stokes.

The second variety which occurs in Texas extends from northern Arkansas and eastern Oklahoma into eastern Texas and western Louisiana where it extends as far south as the Houston area. This form may be known as var. *plantagineum* Engelm & Gray. It is distinguished by its longer leaves which are usually glabrous above and the upper stems and branches which are usually green and glabrous or nearly so. The inflorescences are highly branched and usually more than one-third the length of the plants. The var. *plantagineum* usually occurs in sandy soil on the edges of oak or pine forests. The recently described *E. vespinum* Shinners may be considered a synonym of var. *plantagineum*.

In reviewing the overall species, other taxa which seem to be only varietally distinct are var. **harperi** (Goodm.) Reveal, stat & comb. nov. (based on *E. harperi* Goodm., Bull. Torrey Bot. Club 74: 329. 1947) of Alabama and the var. *gnaphalifolium* Gandg. of central Florida. This latter plant has been called *E. floridanum* Small. Both of these varieties are distinguished by their large size and geographical distribution from var. *plantagineum* with some difficulty.[2]

It is possible to report that both the var. *longifolium* and the var. *plantagineum* have chromosome numbers of n = 20. Counts of var. *longifolium* have been made on the following populations: 4.5 miles east of Tascosa, Potter Co., Texas, *Reveal &. Davidse 876;* 2 miles north of Benjamin, Knox Co., Texas, *Reveal & Davidse 884*; 15 miles south of Claude, Armstrong Co., Texas, *Reveal & Davidse 877*; Steamboat Mts., Taylor Co., *Reveal & Davidse 885*; and, 2 miles west of Gay Hill, Washington Co., *Reveal & Davidse 896*. The counts of var. *plantagineum* were made on the following populations: 1 mile north of Hearne, Robertson

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[2] A recent examination of some type material of *Eriogonum longifolium* at the New York Botanical Garden and the Royal Botanical Garden at Kew points out a possible problem with regard to this species. A fragmented specimen at NY seems to be var. *plantagineum* while a second sheet and a collection at K seem to be var. *longifolium*. Nuttall did make two collections of this species, but until the type material at the British Museum can be critically examined, some question as to the exact identity of var. *longifolium* must remain.

Co., Texas, *Reveal & Davidse 893*; and, 12 miles south of College Station, *Reveal et al. 894.*

7. *Eriogonum jamesii* Benth. in DC. In Texas two forms of this species are found. The var. *jamesii* occurs in the western Panhandle of northern Texas and in the mountains of western Texas. The var. *undulatum* (Benth. in DC.) S. Stokes ex M. E. Jones is known in Texas only from the Chisos Mts., Brewster Co., although its overall range extends southward into northeastern Mexico. The var. *undulatum* may be distinguished from var. *jamesii* by its crispate leaves and the thinner aspects of the stems and branching, woody, caudices which form large spreading mats.

A chromosome count of n = 20 may be reported for the var. *jamesii* based on the following populations: 13 miles south of Buena Vista, Chaffee Co., Colorado, *Reveal & Davidse* 867; 8 miles east of Springer, Colfax Co., New Mexico, *Reveal & Davidse* 874; and, 4.5 miles east of Tascosa, Potter Co., Texas, *Reveal & Davidse 875*. A count of n = 20 was obtained from a single population of var. *undulatum* from Upper Green Gulch, Chisos Mts., Brewster Co., Texas, *Reveal & Davidse 907.*

8. *Eriogonum* **correllii** Reveal, sp. nov. Robusta perennis herba, (1) 2-4 dm. alta; laminae foliorum lanceolatae vel ± ellipticae, (2) 4-12 (15) cm. longae, 1-3.5 cm. latae, subtus albo-tomentosae, supra floccosae vel glabrae et viridis, petiolis (2) 4-10 cm. longis, tomentosis, basi expansa, petioli (5) 10-20 mm. longi, 8-15 mm. lati; caules tomentosi, 0.5-1.5 dm. alti, bracteis foliaceis, 1-4 cm. longis, 5-15 mm. latis, subtus albo-tomentosis, supra floccosis vel glabris et viridis; inflorescentiae cymosae, 5-15 cm. longae, tomentosae; involucra turbinata vel campanulata, 3-5 mm. longa, 2-4 mm. lata, exta tomentosa, intus glabrus, 5-7 -lobata, bracteolis linearis, 2.5-3.5 (4) mm. longis, pedicellis 2.5-4.5 mm. longis, sparse pubescentibus; perianthia stipitata, flava, (2-5) 3-7 mm. longa, extra sparsa pubescenta, intus glabra, segmentis dissimilibus, extris 2.5-4 mm. longis, intus 4-7 mm. longis; stamina 3-5 mm. longa, filamentis basi pilosis, antheris 0.5-0.8 mm. longis, oblongis; achaenia 3.5-5 mm. longa, sparse pubescentia. N = 20.

Robust perennial herbs from large, woody, gnarled, caudices; leaves basal, often on elongated branched caudices 1-5 cm. long, the leaf-blades lanceolate to ± elliptic, (2) 4-12 (15) cm. long, 1-3.5 cm. wide, densely white-tomentose below except for the obvious yellowish- or greenish-brown floccose to glabrous midveins, floccose to glabrous and green above, the leaf-margins entire, the petioles 4-10 cm. long, tomentose, the clasping petiole-bases (5) 10-20 mm. long, (5) 8-15 mm. wide, densely

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Fig. 1. Illustration of *Eriogonum correllii* showing (A) the entire plant, (B) an involucre with several flowers within it, (C) a single flower in anthesis, (D) a single flower in fruit, and (E) an achene.


C
Tui
A
B
E
D

white-tomentose without, light-brown to tan and glabrous within except for the margins which are fringed with short hairs at the bases in some and the matted tufts of tomentum at the apices; flowering stems tomentose, (1) 2-4 dm. high, stoutish; inflorescences cymose, trichotomous at the first node, dichotomous or rarely trichotomous above, 0.5-1.5 dm. long, the bracts foliaceous, similar to the leaves only considerably reduced, 1-4 cm. long, 5-15 mm. wide, ternate; involucres turbinate to campanulate, 3-5 mm. long, 2-4 mm. wide, densely tomentose without, glabrous within, 5-7-lobed, the teeth less than 0.5 mm. long, the bractlets linear, 2.5-3.5 (4) mm. long, densely hirsutulous with long white cells up to 0.8 mm. long, the pedicels 2.5-4.5 mm. long, sparsely pubescent with white or hyaline hairs up to 0.5 mm. long, becoming less abundant toward the stipitate bases, several-flowered; perianth greenish-yellow to sulfur-yellow, (2.5) 3-7 mm. long, on stipes 1-2 mm. long, the calyx-segments dissimilar especially in fruit, the outer segments in anthesis densely pubescent with long hyaline hairs mainly along the midribs and bases, 2.5-4 mm. long, in fruit the pubescence becomes less abundant with the segments 4-5 mm. long and up to 2 mm. wide, the inner segments in anthesis densely pubescent with long hyaline hairs, 4-5 mm. long, in fruit the pubescence becomes less abundant but more dense than that of the outer segments, becoming 4-7 mm. long and up to 3 mm. wide, the outer segments becoming reflexed about half their length in fruit so as to be spreading outward with the inner segments erect and enclosing the fruit; stamens 3-5 mm. long, exserted from the spreading flowers in anthesis, the filaments pilose at the bases with stiff horizontal hyaline cells, the anthers 0.5-0.8 mm. long, oblong, yellow, the pollen grain elliptical with a wide single furrow, golden-yellow; ovary greenish-yellow, sparsely pubescent at the apices and along the lower portions of the styles; achenes light brown to brown, 3.5-6 mm. long, sparsely pubescent at the 3-angled apices, the bases glabrous; embryo straight. N = 20.

TYPE: TEXAS: Armstrong Co.: 15 miles south of Claude along Texas Highway 284, on the upper breaks of Palo Duro Canyon of the Prairie Dog Town fork of the Red River, ca 200 to 400 m west of the highway and ca 5 to 25 m down the slope, associated with *Quercus* and *Juniperus*, elevation 3500 feet, 23 August 1967, *James L. Reveal & Gerrit Davidse 878* UTC! 34 isotypes will be distributed to major herbaria from UTC.

Representative specimens:

TEXAS: Armstrong Co.: 15 mi s of Claude, 10 Oct 1964, *Correll 30383* (LL); Palo Duro Canyon, Terrill Christian Figure Three Ranch, 12 Sep 1964, *Rowell 10657* (TTC). Briscoe Co.: 5.6 mi nw of Quitaque, 26 Sep. 1935, *Parks & Cory 17271, 17272* (TAES); 11 mi e of Silverton, 24 Aug 1967, *Reveal & Davidse 881* (UTC); 5 mi w. of Quitaque, 20 Jun 1945, *Whitehouse 10022* (SMU). Floyd Co.: Blanco Canyon, 30 May 1934, *Reed 3750* (TTC). Hardeman Co.: Medicine Mound: 21 Oct 1952, *Correll 15148*

(LL), 20 Jun 1945, *McVaugh 7220* (LL, SMU), 24 Aug 1967, *Reveal & Davidse 883* (UTC).

Eriogonum correllii, a new species of the subgenus *Oligogonum* Nutt., has been known in Texas for several years as *E. jamesii* var. *flavescens* S. Wats. However, the var. *flavescens* is known only from the west side of the Rocky Mountains, and even so, the form of *E. jamesii* that this new species comes closest to in its gross morphology is an undescribed form from the high mountains of south-central New Mexico. *Eriogonum correllii* differs from var. *flavescens* in the larger leaves and stature, in its large bracteate, compound inflorescence, large flowers and the outwardly reflexed calyx-segments in fruit. From the var. *neomexicanum*, the Texas species differs mainly in the same features as noted above except that the leaves of both are similar as far as size is concerned. Nevertheless, the leaves of *E. correllii* are densely tomentose below while those of the New Mexico form are less tomentose and much thinner than the thick leaves of the species.

The new species seems to be most closely related to *Eriogonum allenii* S. Wats, which is highly restricted to the shale outcrops in Virginia and West Virginia. There are several species found on the Appalachian shale slopes which seem to have closely related species near or in the Rocky Mountains. Four of the more characteristic shale slope endemics are *Eriogonum allenii*, *Trifolium virginicum* Small, *Oenothera argillicola* Mack., and *Senecio antennariifolius* Britt. In explaining this disjunction, it is often suggested that several species, including some of these endemics, were forced southward by advancing glaciers after occupying areas considerably further north, with the glaciers destroying the intermediate populations.

Although it would be unwise to make another generalization in regard to all of the Appalachian endemics, as far as *Eriogonum allenii* is concerned, it might be equally suggested that its ancestoral types moved eastward along a southern route from the southern end of the Rocky Mountains. As I have mentioned (Reveal, in press), it seems rather likely that the disjunct populations of *E. longifolium* Nutt. found from Texas to Florida could be explained by an eastward movement of the species across the Gulf Coast Plains and with the intermediate populations being ultimately destroyed by high water due to melting glaciers.

It is my belief that both *Eriogonum allenii* and *E. correllii* were derived from *E. jamesii* Benth. in DC. If this should be the case, then it may have been that *E. jamesii* was rather widely scattered from the southern Rocky Mountains across the southern tier of states to the low Appalachian Mountains. Then, as with *E. longifolium*, with the reduction of the interconnecting populations, the various isolated populations were able to evolve independently of each other into morphologically distinct, highly specialized, and uniquely isolated taxa.

The chromosome count reported here is based on *Reveal & Davidse*

878, *881*, and *883*. A similar count has been determined for *E. allenii* (Sister Elizabeth Henry, Trinity College, Washington, D.C., pers. comm.).

The name is selected to commemorate the collector of the specimens which first drew my attention to the distinctiveness of the population, Dr. Donovan S. Correll of the Texas Research Foundation. Most of the specimens that I had seen before were merely in leaf or in very early anthesis, but the Correll specimens cited above were in full flower and its characteristics could be readily determined.

9. *Eriogonum lachnogynum* Torr. This species is infrequently found in the northern Panhandle region of Texas where it is distinctive and not confused with any other species in the state. I have seen specimens from as far south as Deaf Smith and Randall counties. This species, as well as those following except for the last four, belong to the subgenus *Eucycla* (Nutt.) Kuntze.

10. *Eriogonum havardii* S. Wats. Throughout most of its range in western Texas, this species has basal leaves which are 1-3 cm. long, however in northern Culberson and Hudspeth counties and adjacent southern New Mexico, the leaves may be up to 5 cm. long. This longer leafed form has been named *E. leucophyllum* Woot. & Standl., but no sharp distinction exists between these two extremes as all intermediate leaf sizes have been seen. In Texas, *E. havardii* is found in the mountains from Val Verde Co., north.

11. *Eriogonum fendlerianum* (Benth. in DC.) Small. To my knowledge this species has been collected only once in Texas, and then no exact location data were given. As recently discussed by Reveal (1968), this species ranges from southwestern Colorado and adjacent northern New Mexico across to near the Texas line in Quay Co., New Mexico. The only Texas collection was collected by Rammel (US). I suspect that the species is to be found on the western edge of the Texas Panhandle.

12. *Eriogonum wrightii* Torr. ex Benth. in DC. In Texas this species is represented by var. *wrightii*, and poses no real problem, although that can not be said for the rest of its range which extends to the Pacific coast in the mountain ranges of the deserts. This species may be readily found in the low mountains of western Texas growing with *E. tenellum*.

13. *Eriogonum suffruticosum* S. Wats. This species is possibly the most interesting of the Texas buckwheats. It flowers in late March and April, and the plants are in full fruit by May. The flowers soon fall after the fruits are mature. Yet, while in the process of flowering and fruiting, some unique modifications occur in the flower which are not seen in any other species. The calyx-segments are dissimilar. The outer segments are fan-shaped while the inner segments are narrowly oblanceolate. In anthesis the inner segments are turned over each other and thus hid from view because of the wider outer segments. However, as the fruit matures, it grows upwards and forces the inner segments upwards as these segments tightly enclose the fruit. At the same time the outer segments

now curve outwards exposing even more of the inner segments. Thus, the flower, when seen in anthesis looks totally different when seen in fruit.

As this species is exceedingly rare, I would like to document all of the collections that I have seen.[2]

TEXAS: Brewster Co.: Along the road to Agua Frio, 6 mi w of the Alpine-Terlingua road, 18 Apr. 1961, *Correll & Rollins 23642* (LL); Bofecillos Mts., 1883, *Havard s.n.* (GH), the holotype; 5 mi nw of Nine Points Mesa, *Muller 5197a, 5197b* (LL, NY, SMU). Jeff Davis Co.: 6.5 mi e of Agua Fria Ranch, 13 Apr 1936, *Parks & Cory 18552, 18554* (TAES).

14. *Eriogonum annuum* Nutt. and 15. *Eriogonum multiflorum* Benth. In the Texas flora it is impossible to discuss one of these species without mentioning the other. Both are the most frequently collected species in the state and collectively the most widely distributed species. Flowering specimens of *E. annuum* may be quickly distinguished from *E. multiflorum* by its obovate outer calyx-segments as the outer segments of the latter species are oblong-cordate. So distinctive are these two species that it is difficult to comprehend how flowering specimens have been misidentified. As several nonflowering specimens have been collected and as it is assumed that other nonflowering specimens will be collected in the future, several other morphological features may be used to distinguish the two species.

Characteristics	*E. annuum*	*E. multiflorum*
Stem tomentum	Whitish, felty	Whitish early, becoming green and brownish at maturity, not felty
Leaf shape	Oblong to oblanceolate	Lanceolate, oblanceolate, elliptic or ovate
Leaf tomentum	Densely white below, less so above	Brownish-white below, greenish above
Involucre size	(2) 2.5-4 mm. long, 2-2.5 mm. wide	2-2.5 mm. long and wide
Involucre tomentum	Densely white tomentose	Sparsely whitish-brown to brown tomentose to glabrous
Inflorenscences	Elongated with few, long branches, open	Compacted with several short branches
Flowering time	Mainly from May to Nov.	Mainly from August to Nov.

Although even some specimens may still not be identifiable, it is hoped that the above summary will be helpful. As the species tend to be weedy, and seem to be rapidly moving throughout the state, the geographical distribution in Texas will change over the years. At present, however, *E. annuum* is found throughout most of the state except along the immediate Gulf Coast Plains where *E. multiflorum* is most common.

[2] There are likely some additional collections at Sul Ross State College, Alpine, Texas, but an attempt to see material in this herbarium was denied by the curator.

Nevertheless, *E. multiflorum* is known to extend as far west as Val Verde Co. and as far northwest as Lynn Co.

A chromosome count of n = 20 may be reported for *Eriogonum annuum* based on the following populations: 5 miles west of Parnell, Hall Co., Texas, *Reveal & Davidse 882;* 3 miles east of Mason, Mason Co., Texas, *Reveal & Davidse 887;* L. B. Johnson's Ranch 16 miles east of Fredericksburg, Gillespie Co., Texas, *Reveal & Davidse 898.*

A chromosome count of n = 20 may be reported for *Eriogonum multiflorum* based on the following population: 9 miles southeast of Elgin, Bastrop Co., Texas, *Reveal & Davidse 897.*

16. *Eriogonum polycladon* Benth. in DC. This weedy species is presently known in Texas only from Jeff Davis and Hudspeth counties, but it should gradually spread through much of western Texas over the years. A member of the subgenus *Oregonium* (S. Wats.) Greene, it is the only annual species which has involucres appressed to the stems in the state.

17. *Eriogonum tenellum* Torr. The subgenus *Ganysma* (S. Wats.) Greene contains few perennials, yet those that are found in it are most interesting. In the Texas species of this subgenus, there is only one perennial, *E. tenellum,* and within it are two rather distinct varieties. The var. *tenellum* which is distinguished by its strictly basal leaves, occurs from eastern Colorado south along the extreme western edge of northern Texas into the low mountains of western Texas with a few scattered populations in the grasslands area of the Rio Grande basin. On the granitic outcrops of central Texas is the var. *ramosissimum* Benth. in DC. which has elliptic to deltoid leaves sheathing up the stems to 15 cm. I have seen specimens of this variety from Mason, Llano, Burnet, and Gillespie counties. In the low mountains of western Texas in Presidio, Brewster, Terrell, and Val Verde counties ,the var. *platyphyllum* (Torr. ex Benth. in DC.) Torr. is infrequently found. The leaves of this variety are ovate to orbicular and sheath up the stems to 20 cm. It is this variety that is mostly commonly encountered in northeastern Mexico.

18. *Eriogonum abertianum* Torr. Without a doubt the most variable and perplexing buckwheat in Texas is *E. abertianum.* As the species flowers during most of the year in the state, it is possible to find specimens which are hardly a centimeter high, while at a different time the same population may have plants that are over 4 dm. high. Likewise the amount of pubescence varies with the time of the year that the collections are made. In general the low plants occur in the spring and tend to be more villous, these gradually enlarge and become less pubescent. As with most annual buckwheats, it is possible to have two or more different flowering seasons of this species. In late March to early May, new plants may be found, and normally the same kind of plant may be found after the "rainy season" in late September and October. Some of

the early flowering plants may die, but a majority usually survive and grow to be fairly large and even somewhat woody. Although it is now impossible to make any positive statements in this regard, it seems that if the summer months are fairly wet, then the plants tend to be erect and branch at the top. However, if the summer months are fairly dry, then the plants tend to branch profusely at the base. Then, when one adds to this seasonal variation the effects of edaphic conditions, the problems multiply. On the more sandy, well drained soil, especially where some moisture is available, the plants tend to be larger and more robust with denser pubescence than might otherwise be found in plants in more adverse conditions.

Thus, in considering all of these variations, it is impossible for me to maintain any of the taxa that have been proposed. The species names, *E. cyclosepalum, lappulaceum,* and *pinetorum,* all proposed by E. L. Greene, and the various infraspecific combinations are all considered by me to be conspecific.

In Texas, *Eriogonum abertianum* occurs from Howard Co. westward into northern Mexico and adjacent New Mexico and Arizona.

19. *Eriogonum rotundifolium* Benth. in DC. This low, spreading, glabrous and glaucous, annual herb is common in disturbed areas in western Texas with two outlying populations in Knox Co. and Dimmit Co. *Eriogonum rotundifolium* var. *angustum* Goodm. is now reduced to synonymy under *E. rotundifolium* as the specimens upon which the name was based are simply late flowering plants of the species in which the flowers had not fully matured before the lateness of the season stopped the growth. Even so, there are a few, typical, fan-shaped fully developed flowers on those specimens cited as the type and paratype.

In summary, the *Eriogonum* flora in Texas is not extensive nor difficult to distinguish. For the most part the species are on the fringe of their overall range and thus the infraspecific problems often found elsewhere are normally not found here. It is hoped, however, that the treatment presented here will be helpful to those who will find an interesting buckwheat and would like to know more about it.

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